

**STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION**

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|--|---|--------------------|
| AMEREN TRANSMISSION COMPANY OF ILLINOIS |) | |
| |) | |
| Petition for a Certificate of Public Convenience and |) | |
| Necessity, pursuant to Section 8-406.1 of the Illinois |) | |
| Public Utilities Act, and an Order pursuant to Section 8- |) | Docket No. 12-0598 |
| 503 of the Public Utilities Act, to Construct, Operate and |) | |
| Maintain a New High Voltage Electric Service Line and |) | |
| Related Facilities in the Counties of Adams, Brown, |) | |
| Cass, Champaign, Christian, Clark, Coles, Edgar, Fulton, |) | |
| Macon, Montgomery, Morgan, Moultrie, Pike, |) | |
| Sangamon, Schuyler, Scott and Shelby, Illinois. |) | |

TESTIMONY OF DAVID W. BUSH ON BEHALF OF STOP THE POWER LINES COALITION

Direct Testimony Of David W. Bush

On Behalf Of

Stop The Power Lines Coalition

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3 **I. INTRODUCTION AND WITNESS QUALIFICATIONS:**
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5 **Q: Please state your name, address, and relationship to Intervenor organization.**

6 A: My name is David W. Bush, and my address is 105 Orchard Way, Camillus, NY 13031.
7 I am Professional Engineer and a Professional Land Surveyor, and I have been acting as a
8 consultant to the STOP THE POWER LINES COALITION (the "Coalition"),
9 which intervened in this proceeding, in December 2012.

10 **Q: Please summarize your educational background and professional experience.**

11 A: See a copy of my resume which is attached as STPL Exhibit 4.1 to this testimony.

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13 **II. PURPOSE AND SCOPE:**

14 **Q: What is the purpose of your testimony?**

15 A: I will be discussing the problems and issues surrounding that portion of the segment of
16 the Primary Route proposed by ATXI, running from Kansas to Sugar Creek, to be erected along
17 the Southern boundary of the quarry site of QUALITY LIME COMPANY.

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19 **III. EXPLANATION OF PROPOSED STEEL POLE CONSTRUCTION:**

20 **Q: Do you have any objections to the segment of the Primary Route proposed by ATXI,**
21 **running from Kansas to Sugar Creek?**

A: Yes. As depicted on ATXI Exhibit 4.2 (Part 86 of 100, page 1 of 2 and page 2 of 2) (and, also, on STPL Exhibits 1.4 & 1.5), the proposed ATXI Primary Route runs along the Southern boundary of the quarry site of QUALITY LIME COMPANY, located Southeast of Marshall, Illinois.

Firstly, the continual presence of lime dust (arising from the operations of the stone quarry) will be and become a problem to the 345kV transmission line and its components; and secondly, the necessary blasting attendant to the operations of the stone quarry will also be and become a problem to the 345kV transmission line and its components.

Q: Are you offering any exhibits in support of or to aid your testimony?

A: Only one. [STPL Exhibit 4.2] is a notated copy of ATXI Exhibit 7.1. The notations thereon are defined as follows:

Point (A) represents the fasteners for the two wires for each phase of the transmission line;

Point (B) is the insulator for each phase of the transmission line; and

Point (C) represents the two (2) static wires (to provide lightning and fault current protection).

IV. **PRESENCE OF LIME DUST:**

Q: Would you explain the problem with the continual presence of lime dust?

A: The efficiency of an electrical power supply system is based mainly upon the continuity of service, avoiding faults that pose economic risks and potential losses for the companies and their customers. To maintain this continuity, one of the main problems is the effect produced by contamination in the insulators of electric lines.

The insulator begins to fail when the particles that exist in the air settle on the surface of the insulator and combine with the humidity of fog, rain or dew. The mixture of particles, plus the humidity form a layer that can become a conductor and allowing passing electric current to “short circuit.” Unless there is adequate maintenance, and depending upon the chemistry of the particle, the electrical power can be affected by a possible flashover in the insulator.

Q: How does lime dust interfere with transmission of power in an electrical transmission line?

A: Lime dust becomes a potential source of interference to high voltage transmission lines, when the lime dust becomes air-borne, which is caused by:

- (a) Wind blowing across the quarry site; OR
- (b) Equipment moving around the quarry site; OR
- (c) Blasting; OR
- (d) Moving aggregate from one part of the quarry to the stone crusher; OR
- (e) Bulldozing / stock piling aggregate on the quarry site; OR
- (f) Product departure by large truck.

Q: What happens when the lime dust becomes air-borne?

A: After becoming air-borne, the lime dust collects on transmission line insulators (Point (B) on STPL DWB Exhibit 4.2) and hardware. Over time, the accumulating lime dust compromises the insulation capability of the insulators and causes a “phase to ground fault,” which means a short circuit from the phase conductors (Point (A) on STPL Exhibit 4.2) over the insulator (Point (B)) through the cross arm holding the insulator and conductors, and down the steel pole to the “ground.”

Q: What is the significance of this “phase to ground fault”?

68 A: It is a single contingency failure in the grid/system component. In system design, you
69 design for one such failure. Most systems cannot take a second contingency failure, without
70 shedding capacity or suffering grid component damage.

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72 Q: **What can be the magnitude of a “phase to ground fault”?**

73 A: Depending upon the amount of accumulated lime dust, the failure can be simply a
74 “short” circuit of power from the conductor(s), across the support arm and down the pole to the
75 ground (being the earth). It could include mechanical failure of an insulator, causing a
76 detachment of the conductor(s) from the crossarm creating a conductor to ground contact or a
77 phase to ground fault. Of higher concern, a low conductor to ground clearance could create a
78 severe safety concern.

79 In the latter case, we might be talking about a loose 345kV line, until it grounds out.

80 Q: **How is the accumulated lime dust to be removed from the insulators?**

81 A: The remedy to lime accumulation is cleaning and washing the insulators. Spray washing
82 is not effective. Neither is rain action.

83 Mechanical washing of some form is required.

84 Q: **How about any possible effects on the hardware?**

85 A: Accumulated lime will collect water, causing longterm hardware corrosion leading to
86 mechanical failure. In this instance, we are not just talking about a power conductor problem; it
87 is a static wire (Point (C) on STPL Exhibit 4.2) problem as well. This failure could be critical, in
88 that it might affect optical ground wire which would control key system protection
89 communication from one station to another. Also, like power conductors, it could result in
90 detachment of the static or OPGFW from the support arm. If that occurs, the geometry as shown

in ATXI 7.1 would allow a gravity drop not stopped by the power conductor support arm. Like the phase drop, this has the high probability of creating a severe safety with quarry equipment or agricultural equipment in the area dragging it to contact the phase conductors.

Q: To alleviate the lime dust problem, are you suggesting that QUALITY LIME COMPANY should discontinue its quarry operations?

A: No. The stone quarry is an existing, on-going business, which supplies aggregate, crushed stone, lime, and other products, for area farmers and other businesses. The lime dust attendant to quarry operations is only a factor for the proposed 345kV transmission line.

Q: Under 220 ILCS 5/8-406.1, the Commission shall grant a certificate of public convenience and necessity, if it finds that the Project, among other things, is the “least-cost means” of satisfying the stated objectives. Will the continual presence of lime dust be a persistent maintenance problem if the proposed ATXI Primary Route is adopted?

A: Simply stated. Yes.

Running the Primary Route on the Southern boundary of an active stone quarry is and will be persistent maintenance problem. For this portion of the Kansas to Sugar Creek segment, the continual presence of lime dust will increase the cost of line operations and maintenance, and it will substantially shorten the useful life of the insulators and hardware, requiring more frequent repair or replacement.

V. BLASTING PROBLEM:

Q: Would you explain the problem with the necessary blasting attendant to the operations of the stone quarry?

A: Blasting causes vibration in overhead system components – both the conductor and the static wire. Excessive vibration (which comes from blasting at the stone quarry) leads to

“grooving” (the back and forth motion wearing on the conductors) and can lead to a mechanical failure resulting in a “phase to ground fault,” due to a dropped conductor or static wire.

Also, in this case, it could cause a failure in the optical ground wire, resulting in a communications problems, which cause the proposed circuit to be taken out of service.

Blasting can also cause a “direct hit” from shot rock. Consequently, it could cause a phase drop or static wire drop, resulting in a “phase to ground fault,” being a first contingency event.

Q: Under 220 ILCS 5/8-406.1, the Commission shall grant a certificate of public convenience and necessity, if it finds that the Project, among other things, is the “least-cost means” of satisfying the stated objectives. Will the blasting at the stone quarry be a persistent maintenance problem if the proposed ATXI Primary Route is adopted?

A: Simply stated. Yes.

As previously stated, running the Primary Route on the Southern boundary of an active stone quarry is and will be persistent maintenance problem. For this portion of the Kansas to Sugar Creek segment, the necessary blasting attendant to the operations of the stone quarry will increase the cost of line operations and maintenance, requiring more frequent repair or replacement.

VI. **CONCLUSION:**

Q: Does this conclude your direct testimony?

A: Yes, it does. Thank you for your attention.